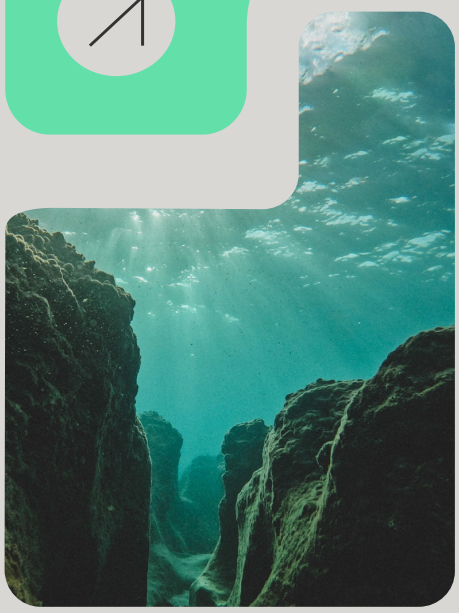
HARISMA

MARITIME SURVEILLANCE

INFO POSTER



OBJECTIVES

OVERVIEW

To develop and validate a state-of-the-art hardware addon for all types of Unmanned Vehicles (land, sea and air) to facilitate swarm communication and distributed data sharing through a DSM service deployment.

OBJECTIVE 1

Design and Implement ML/RL algorithms for swarming behaviour and control of HUVs, leveraging the deployed DSM for UVs interaction and coordination.

OBJECTIVE 2

Develop a Digital Twin for Maritime Surveillance Mission Planning, Monitoring and Control.

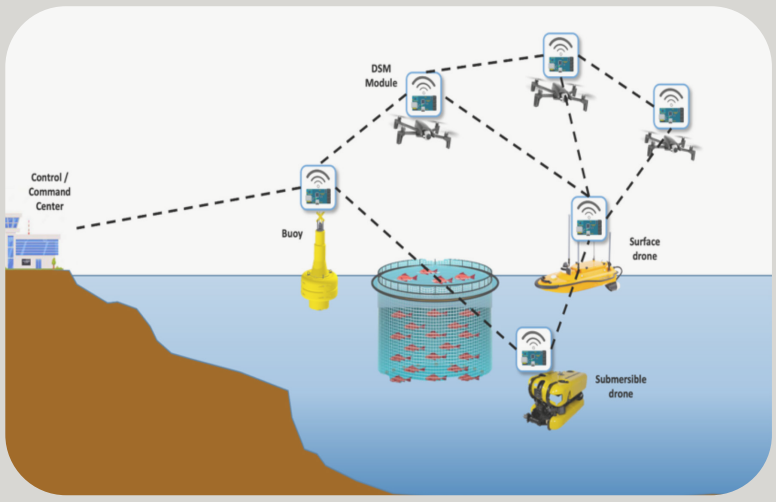
OBJECTIVE 3

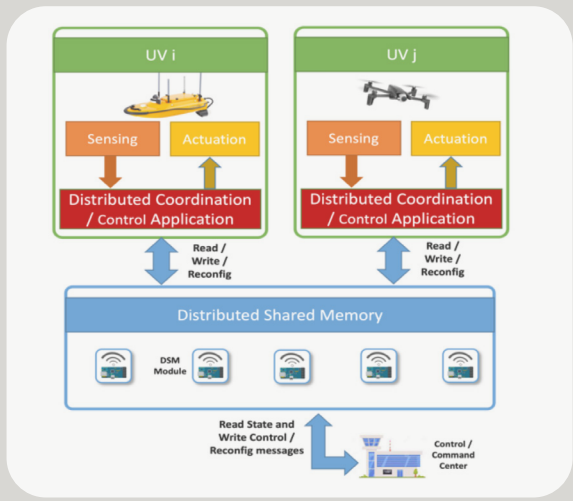
Validate all hardware and software components, as well as the swarming algorithm in a relevant environment.

OBJECTIVE 4

CHARISMA, aims to devise next-generation Maritime Surveillance technology leveraging on heterogeneous autonomous robotic architectures, including unmanned aerial, sea surface and underwater vehicles. Key to this innovation is devising both hardware and software that can be attached as an add-on to existing fleets of Unmanned Vehicles (UVs). The addon will enable UVs to collectively form a mesh network for communication at the lower-level, on top of which a Distributed Shared Memory (DSM) service will be deployed. The DSM will act as the connective tissue for decentralised data exchange that will be critical for devising advanced swarming algorithms to conduct Maritime Surveillance.
These swarming behaviours will be largely based on data fusion Machine Learning models. To monitor and control these capability-augmented UV swarms, a Maritime Surveillance Digital Twin will also be implemented.

By combining the expertise, intellectual property and Proof of Concepts in distributed applications (Algolysis Ltd), maritime research and robotics (CMMI), and digital twins and machine learning (CYENS), we will develop a next generation framework for Maritime Surveillance, that will ensure reliable, robust and dependable data collection, provide a comprehensive digital representation of critical situations for better assessment, and will support decision making and high-level control of UV Swarms by competent operators. The entire framework will be validated and demonstrated in a relevant environment (TRL6).
Specifically, the addon device will be deployed over a set of heterogeneous UVs with advanced swarming behaviours capable of specifically monitoring maritime infrastructure (e.g. aquaculture facilities).





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